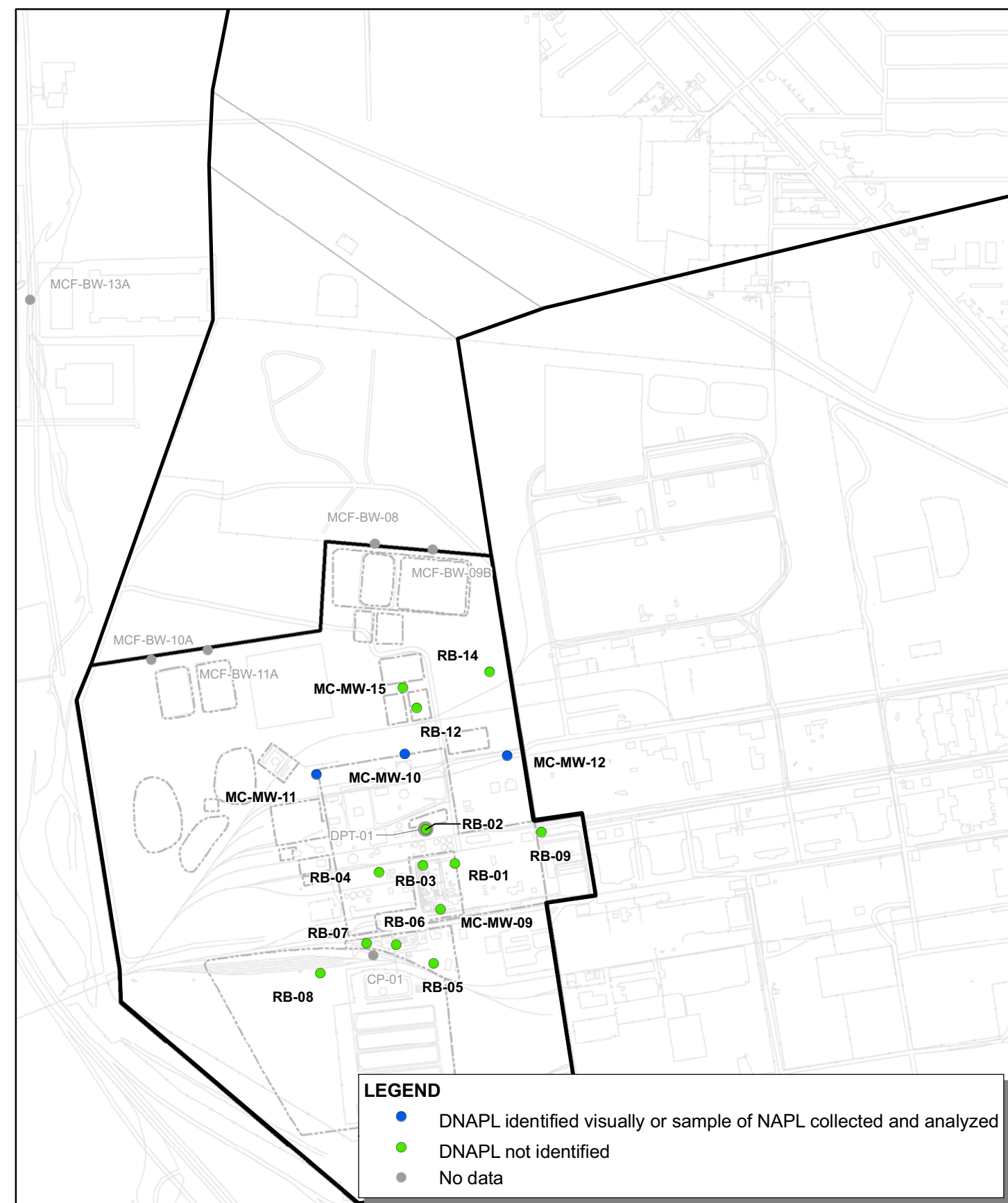
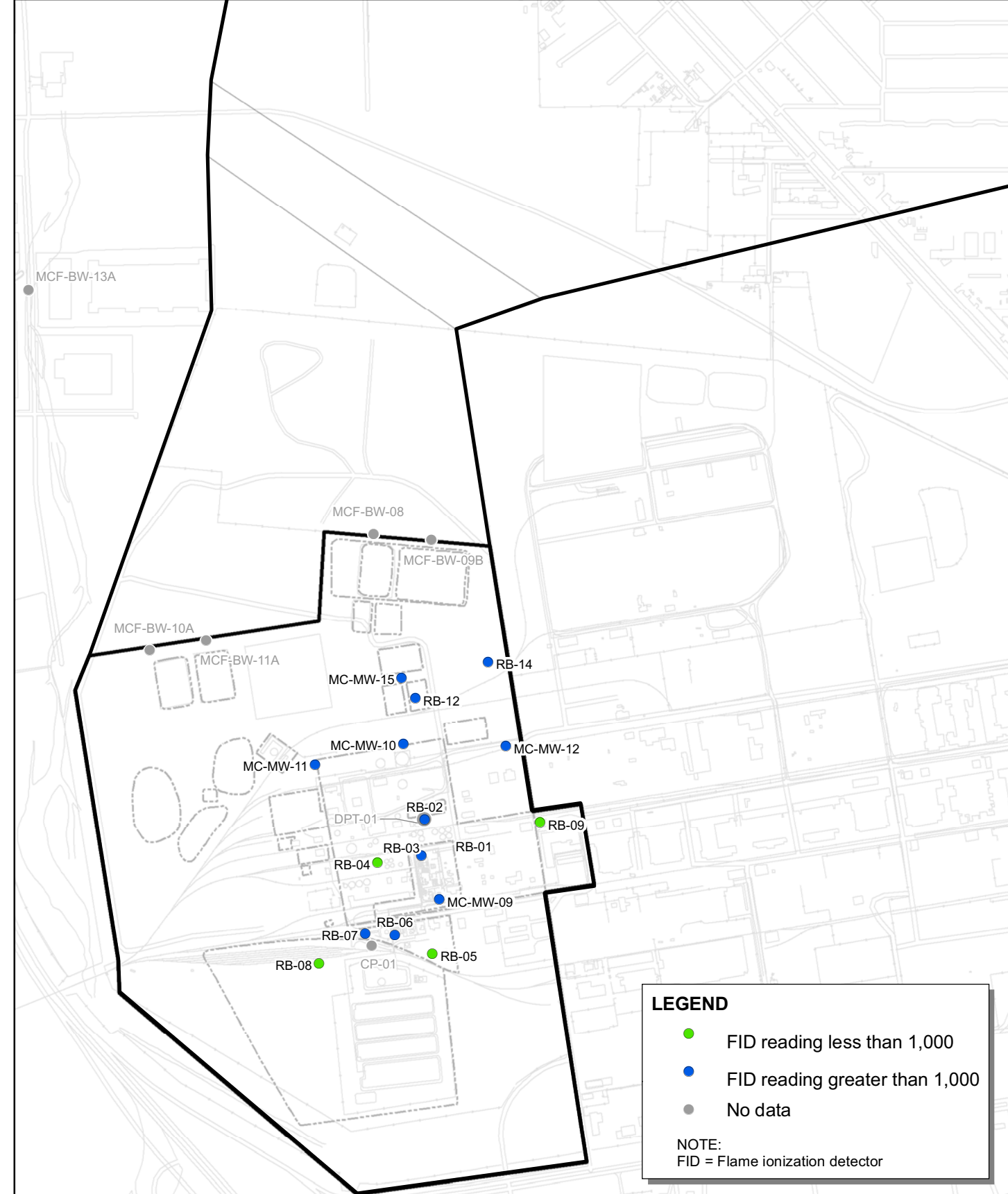


DIRECT EVIDENCE

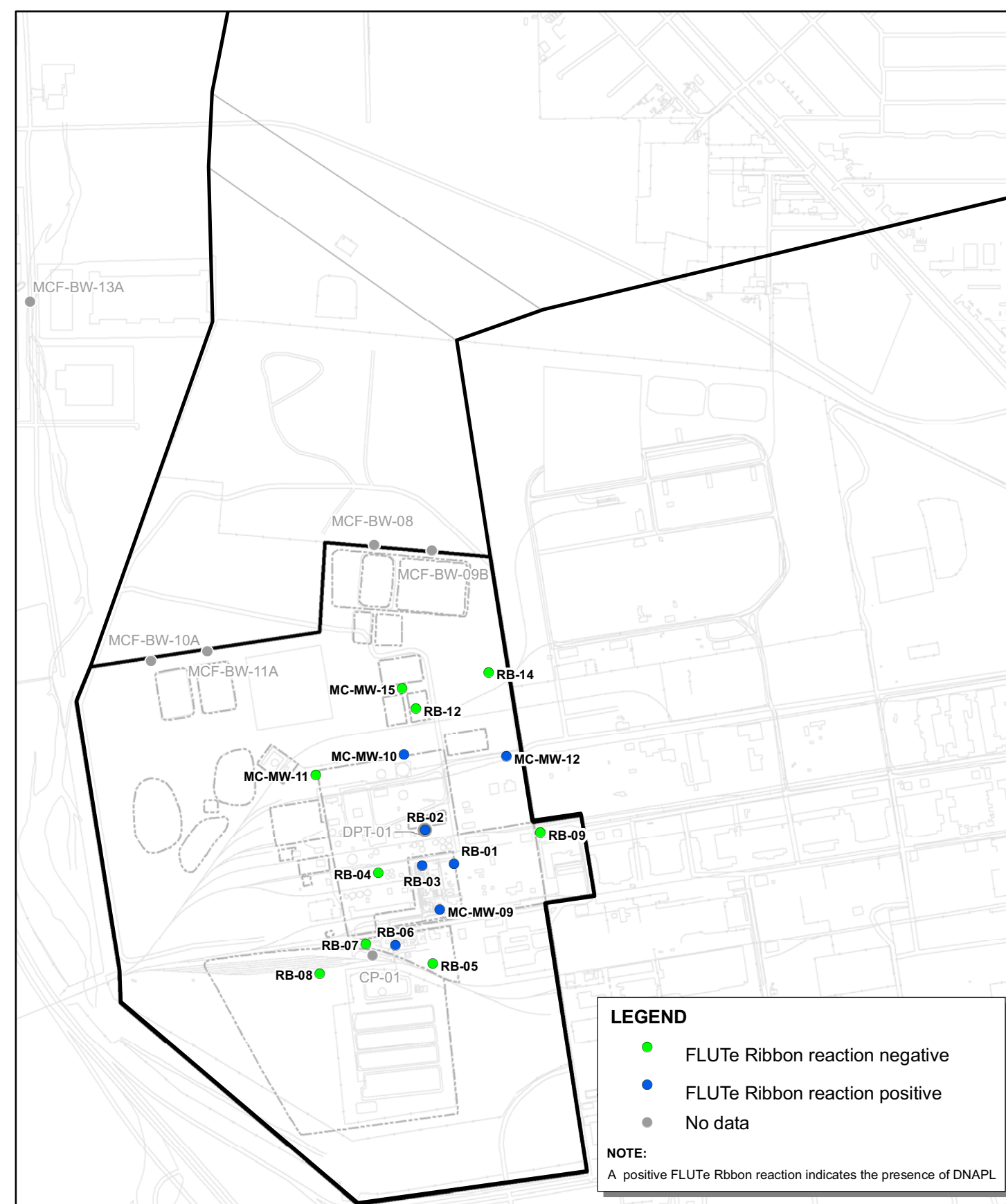


NAPL VISUALLY OBSERVED OR SAMPLED

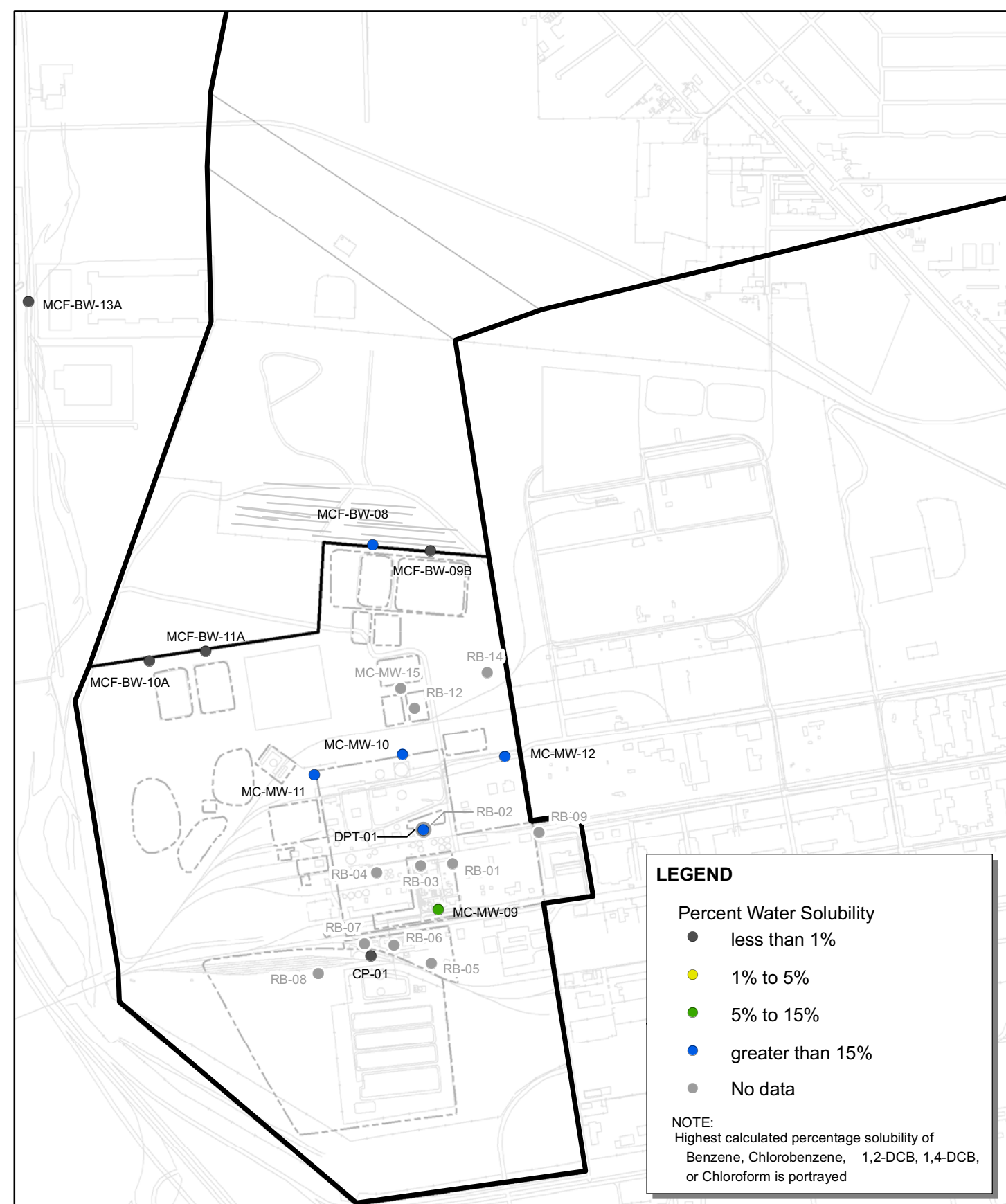
INDIRECT EVIDENCE



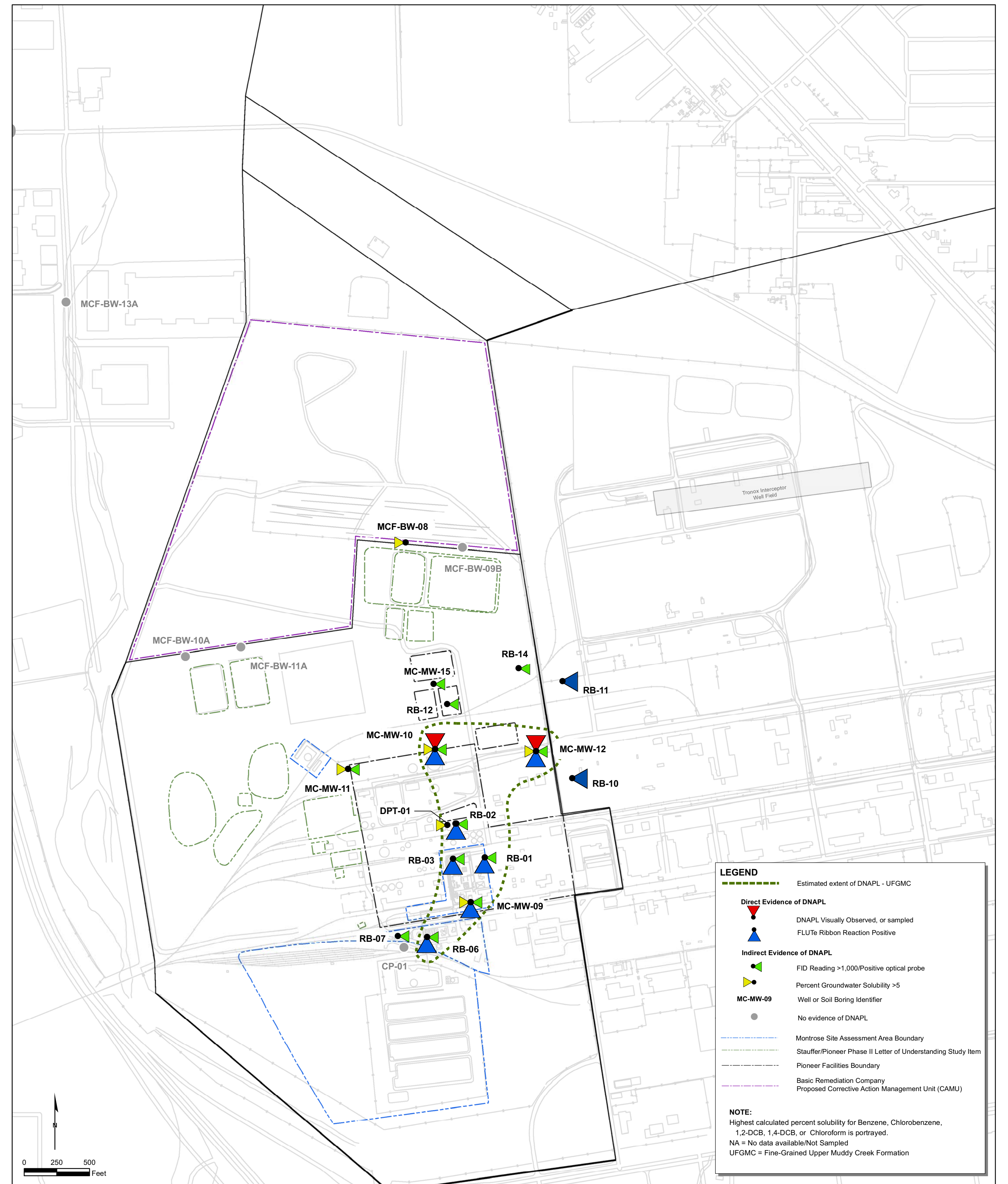
FID READINGS GREATER THAN 1,000
POSITIVE READING WITH OPTICAL NAPL PROBE



FLUTE RIBBON REACTION



PERCENT WATER SOLUBILITY (MAXIMUM)



Evaluating Evidence of DNAPL

Direct Evidence – proof positive that DNAPL exists at location of boring or well.

- Visual evidence and positive FLUTE® ribbon reaction provides evidence of the type of DNAPL present, i.e. residual or disseminated DNAPL in the soil or aquifer matrix.
- Samples of free phase NAPL indicate the presence of pooled NAPL.

Indirect Evidence – indicates that DNAPL may be present locally; used as corroborative evidence of DNAPL; should be evaluated carefully and qualified if direct evidence is not observed at sample location.

- Positive finding using a NAPL probe provides only evidence of the existence of fluids of different specific gravity, density or optical properties; does not provide indication of the chemical make up of the fluid.
- Elevated concentrations of organic chemicals detected in soil vapor or groundwater by chemical analysis or PID/FID measurements only indicate that potentially a DNAPL source exists nearby in the soil matrix or up-gradient in the groundwater, or may indicate the existence of residual elevated dissolved phase concentrations from a former DNAPL source.
- Calculated percent of water solubility data for dissolved phase groundwater samples (1% solubility rule of thumb) has the same limitation as concentration data, if the calculated percent water solubility is less than 100; the data are only an indicator that DNAPL is potentially present nearby or up gradient.
- It is noted, however, that higher values of percent solubility provides stronger evidence of the presence of DNAPL.
- It also must be noted that water solubility of potential NAPL forming organic compounds can vary in composite or mixed NAPLs such as those observed at this site. The presence of common solvents like benzene, PCE, TCE and TCA can complicate the use of calculated percent solubility of the other potential NAPL forming chemicals.
- Presence of organic odors does not provide sufficient evidence to determine if the odors are related to organic compounds as NAPL or as dissolved-phase in groundwater or soil moisture.

CONCEPTUAL SITE MODEL
FORMER MONTROSE AND STAUFFER FACILITIES
HENDERSON, NEVADA

EVIDENCE OF POTENTIAL DNAPL
IN FINE-GRAINED UPPER MUDDY CREEK
FORMATION

HARGIS + ASSOCIATES, INC.
HYDROGEOLOGY • ENGINEERING

PREP BY: JWM
REV BY: MRL
DATE: 7/18/2009
FILE: RTC Fig 4-44 Evidence of DNAPL-UFGMC
PROJECT: 754.27
FIGURE 4-44